31 August 2005

To: Paul Philp
DOE Project Manager, Run IIb CDF Detector Project

From: Pat Lukens
Project Manager for the Run IIb CDF Detector Project

Subject: Run IIb CDF Detector Project July 2005 Report

Attached is the monthly report summarizing the July 2005 activities and progress for the Fermilab RunIIb CDF Detector Project. This report is available electronically at:

http://www-cdf.fnal.gov/run2b.html

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RunIIb CDF Detector Project
Progress Report No. 32
1 - 31 July 2005

I. PROJECT DESCRIPTION

The primary goal of the CDF Run IIb Detector Project is to enable the detector to exploit the physics opportunities available during Tevatron operation through 2008. The data from Run II will represent a set of detailed measurements that can be compared with the predictions of the Standard Model at the highest available collision energy. The increased size of the data sample will allow us to study the top quark by measuring the details of its production and decay mechanism. In addition, we plan precision electroweak and QCD measurements, continued searches for a variety of phenomena that are predicted to exist beyond the Standard Model framework, and to explore CP violation in the *b* quark sector. The detailed physics goals of the upgrade are described in the Technical Design Report (TDR).

The major tasks of this upgrade are:

- Upgrade the calorimeter by replacing the Central Preradiator Chamber with a device with shorter response time to allow operation in a high-luminosity environment, and adding timing information to the electromagnetic calorimeters.
- Upgrade the data acquisition and trigger systems to increase throughput needed for higher luminosity operation and efficiently trigger on the higher multiplicity events of Run IIb.

II. OVERVIEW OF PROJECT STATUS – P. Lukens

The project continues to move towards completion. The remaining subprojects are entering their commissioning phases. The Silicon Vertex Trigger project continues to make use of beam time for tests. The first portion of the system, the AM++ boards, is now fully installed and is used in operations. Event builder tests are also in progress with the real system. Tests for both systems are occurring towards the end of stores, when operations are affected only minimally.

The project is currently 81% complete, based on costs, and is on track for completion before the end of 2005.

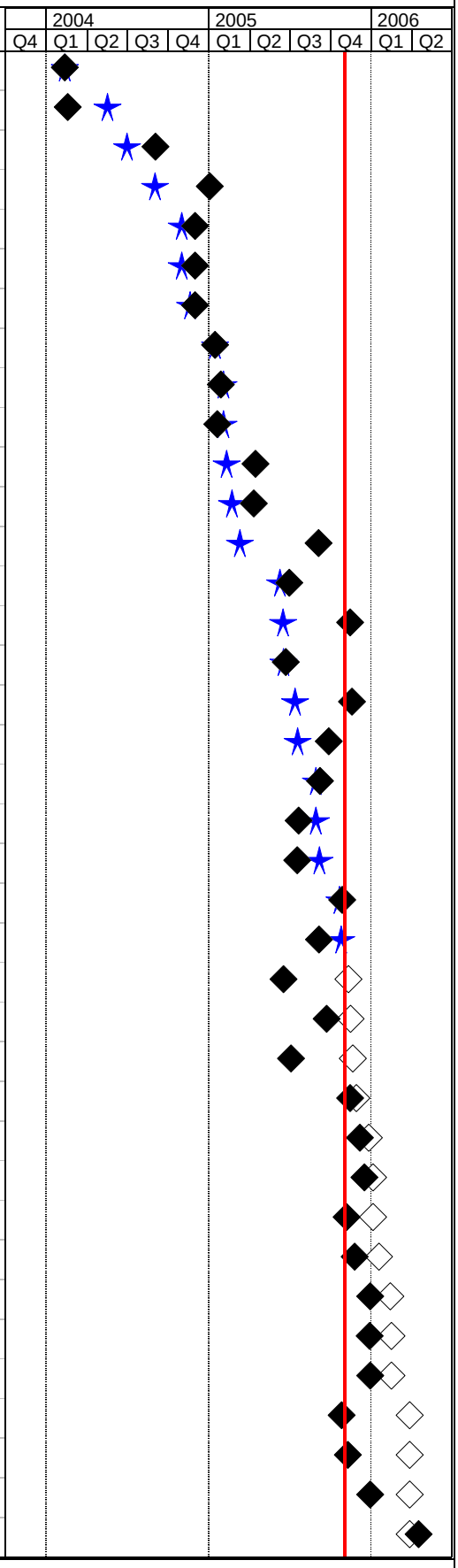
III. PROJECT MILESTONE SUMMARY (as of 31 July 2005)

CDF Data Acquisition & Trigger (L1 and L2) Milestones
Sorted by Baseline Completion Date

WBS	Title	Baseline Comp. Date	Forecast/Actual Completion Date	Complete
1.3.2.6.3	Begin production of Level 2 Pulsar system	12 Nov 03	12 Nov 03	Yes
1.3.1.6.6	First Prototype TDC available for testing	19-Nov-03	16-Feb-04	Yes
1.3.4.4.1.4	Prototype Event Builder hardware arrives	3-Jun-04	31 Mar 04	Yes
1.3.2.10	Pulsar Hardware Ready for Installation	31-Aug-04	20-Aug-04	Yes
1.3.6.1.1.7	Begin AMS Design Work	1-Sept-04	2-Aug-04	Yes
1.3.6.1.3.7	Begin Track Fitter Design	1-Sept-04	2-Aug-04	Yes
1.3.4.5.3	Production Readiness Review - Event Builder	4-Oct-04	2-Jun-04	Yes
1.3.4.5.4.4	Arrival of the Event Builder hardware	15-Oct-04	15-Oct-04	Yes
1.3.11.8.5.5	Begin Purchase of Pulsar Board components	20-Oct-04	4-Nov-04	Yes
1.3.11.5.3.8	Begin Production TDC Mezzanine Card	28-Oct-04	3-Nov-04	Yes
1.3.6.2.6.4	Begin Amp Chip Production	10-Jan-05	22-Nov-04	Yes
1.3.6.2.1.1.5	Begin AMS Mezzanine Card Production	14-Jan-05	11-Nov-04	Yes
1.3.1.17.4	TDC Readout System Complete	21-Jan-05	10-Dec-04	Yes
1.3.11.6.3.6	Receipt of TDC to Finder cables complete	18-Mar-05	11-Aug-05	
1.3.5.3.7	Arrival of 15 PCs from the vendor	23-Mar-05	18-Mar-05	Yes
1.3.2.9	Pulsar Level 2 subproject ready for installation	1-Apr-05	11-Mar-05	Yes
1.3.11.8.8	Begin Joint Testing with Finder Board	4-Apr-05	22-Aug-05	
1.3.11.7.5.8	Begin Production of SLAM Boards	18-Apr-05	8-Jun-05	Yes
1.3.11.4.4.8	Begin Production TDC Fiber Transition Boards	21-Apr-05	31-May-05	Yes
1.3.11.5.3.9	Checkout of TDC Mezzanine Cards Complete	6-Jun-05	26-Jul-05	Yes
1.3.11.2.5.1	Begin Production XFT Finder Boards	8-Jun-05	31-May-05	Yes
1.3.6.1.2.5	Hit Buffer Firmware Complete for Board Test	23-Jun-05	17-Aug-05	
1.3.6.1.3.5	Track Fitter Firmware Complete for Board Test	28-Jun-05	20-Apr-05	Yes
1.3.1.12.6	Installation of Modified TDC's Complete	27-July-05	27-Dec-05	
1.3.4.8	Finish Event-Builder Upgrade	28-July-05	22-July-05	Yes
1.3.10.2	Ready for Accelerator Shutdown 2005	8-Aug-05	6-Oct-05	
1.3.1.12.8	TDC Modification Complete	10-Aug-05	27-Dec-05	
1.3.5.5.5	Arrival of 70 Level3 and 15 DAQ PCs	15-Aug-05	18-Mar-05	Yes
1.3.5.6.5	Arrival of 192 L3 Farm PC's from the vendor	15-Aug-05	29-Aug-05	
1.3.6.1.1.5	AMS Firmware Complete for Board Test	19-Aug-05	14-Apr-05	Yes
1.3.6.3	SVT ready for installation	25-Aug-05	19-Oct-05	
1.3.5.8	Finish Purchase of Computers for L3 DAQ system	6-Sept-05	20-Sept-05	
1.3.11.4.4.9	Checkout of TDC Transition Boards Complete	16-Sept-05	6-Oct-05	
1.3.11.7.5.9	Checkout of SLAM Boards Complete	28-Sept-05	16-Nov-05	
1.3.11.2.5.10	Finder Board Checkout Complete	29-Sept-05	14-Nov-05	
1.3.11.10	XFT Ready for Installation at CDF	29-Sep-05	16-Nov-05	
1.3.8	Finish Run 2b Trigger DAQ project	30-Sep-05	27-Dec-05	
1.3.9	DAQ and Trigger Upgrades Ready for Installation	17-Jan-06	27-Dec-05	

Run IIb Data Acquisition & Trigger Milestones (Level 1 and 2)

Name	Forecast	Baseline	Variance
Begin production of Level2 Pulsar system	**11/12/03**	**11/12/03**	**0 wks**
First Prototype TDC available for testing	**2/16/04**	**11/19/03**	**11.35 wks**
Arrival of the prototype Event Builder hardware	**3/31/04**	**6/3/04**	**-9 wks**
Event Builder Production Readiness Review	**6/2/04**	**10/4/04**	**-17 wks**
Begin AMS Design Work	**8/2/04**	**9/1/04**	**-4.4 wks**
Begin Track Fitter Design	**8/2/04**	**9/1/04**	**-4.4 wks**
Pulsar Hardware Ready for Installation	**8/20/04**	**8/31/04**	**-1.4 wks**
Arrival of the Event Builder hardware	**10/15/04**	**10/15/04**	**0 wks**
Begin Production TDC Mezzanine Card	**11/3/04**	**10/28/04**	**0.8 wks**
Begin Purchase of Pulsar Board components	**11/4/04**	**10/20/04**	**2 wks**
Begin AMS Mezzanine Card Production	**11/11/04**	**1/14/05**	**-8.2 wks**
Begin Ampchip Production	**11/22/04**	**1/10/05**	**-5.8 wks**
TDC Readout System Complete	**12/10/04**	**6/6/05**	**-23.8 wks**
Pulsar Level 2 subproject ready for installation	**3/11/05**	**4/1/05**	**-3 wks**
Arrival of 70 Level3 and 15 DAQ PCs from the vendor	**3/18/05**	**8/15/05**	**-21 wks**
Arrival of 15 PCs from the vendor	**3/18/05**	**3/23/05**	**-0.6 wks**
AMS Firmware Complete for Board Test	**4/14/05**	**8/19/05**	**-18 wks**
Track Fitter Firmware Complete for Board Test	**4/20/05**	**6/28/05**	**-9.8 wks**
Begin Production XFT Finder Boards	**5/31/05**	**6/8/05**	**-1.4 wks**
Begin Production TDC Fiber Transition Boards	**5/31/05**	**4/21/05**	**5.2 wks**
Begin Production of SLAM Boards	**6/8/05**	**4/18/05**	**7 wks**
Finish Event-Builder Upgrade	**7/22/05**	**7/28/05**	**-0.8 wks**
Checkout of TDC Mezzanine Cards Complete	**7/26/05**	**6/6/05**	**7 wks**
Receipt of TDC to Finder cables Complete	**8/11/05**	**3/18/05**	**20.4 wks**
Hit Buffer Firmware Complete for Board Test	**8/17/05**	**6/23/05**	**7.4 wks**
Begin Joint Testing with Finder Board	**8/22/05**	**4/4/05**	**19.4 wks**
Arrival of 192 L3 farm PCs from the vendor	**8/29/05**	**8/15/05**	**2 wks**
Finish Purchase of Computers for L3/DAQ system	**9/26/05**	**9/6/05**	**2.8 wks**
Checkout of TDC Transition Boards Complete	**10/6/05**	**9/16/05**	**2.7 wks**
Ready for Accelerator Shutdown 2005	**10/6/05**	**8/8/05**	**8.5 wks**
SVT ready for installation	**10/19/05**	**8/25/05**	**7.6 wks**
Finder Board Checkout Complete	**11/14/05**	**9/29/05**	**6.3 wks**
Checkout of SLAM Boards Complete	**11/16/05**	**9/28/05**	**7 wks**
XFT Ready for Installation at CDF	**11/16/05**	**9/29/05**	**6.8 wks**
Installation of Modified TDC's Complete	**12/27/05**	**7/27/05**	**20.8 wks**
TDC Modification Complete	**12/27/05**	**8/10/05**	**18.8 wks**
Finish Run 2b Trigger DAQ project	**12/27/05**	**9/30/05**	**11.8 wks**
Data Acquisition and Trigger Upgrades Ready to Install	**12/27/05**	**1/17/06**	**-2.2 wks**



Project: CDF RunIIb DAQ
Staus Date: 7/31/05
Print Date: 8/23/05

Completed Milestone ★

Current Forecast ◇

Baseline Milestone ◆

IV. PROCUREMENT – P. Lukens

No significant procurements were placed in July, 2005.

V. PROJECT HIGHLIGHTS

1.3 – Data Acquisition and Trigger

1.3.1 TDC (Time to Digital Converter) – Eric James

TDC modification continues at a rate of about 10 boards per week when boards are available. As expected, we were not able to install any additional modified boards on the detector in July due to ongoing problems with test equipment at the University of Michigan. To address this issue, we have implemented a new testing procedure for boards in our modification pipeline. Functioning boards removed from the detector and modified are only returned to Michigan for additional testing and repair in cases where the boards fail some portion of the testing done at CDF. This change will allow Michigan to focus more of their available manpower on fixing the problems with their test equipment and hopefully speed the turnaround time for having broken boards returned to CDF. At the end of July, we had enough working, modified spares in hand to re-start the replacement of unmodified boards on the detector. Because of the significant number of broken boards still at Michigan, however, we will only be able to replace on the order of ten boards per access opportunity.

Month	Board Modification		Testing at Michigan		Detector Installation	
	Complete	Remaining	Complete	Remaining	Complete	Remaining
January	39 (13%)	261	9 (3%)	291	0	204
February	61 (20%)	239	43 (14%)	257	21 (10%)	183
March	98 (33%)	202	65 (22%)	235	42 (21%)	162
April	116 (39%)	184	80 (27%)	220	69 (34%)	135
May	126 (42%)	174	109 (36%	191	69 (34%)	135
June	150 (50%)	150	122 (41%)	178	99 (48%)	105
July	156	144	131	169	99	105

1.3.11 XFT (eXtremely Fast Tracker) II – Richard Hughes, Brian Winer, Kevin Pitts

Stereo Linker Association Module (SLAM) Boards: We continued to work with the preproduction SLAM board. Tests with the full stereo algorithm and test vectors are on-going. Several small modifications to the board layout were made and two versions of the final production board were made and stuffed with components. These two boards have an Altera EP1S60 FPGA instead of an EP1S40. This will allow more flexibility in the design.

Software and firmware was developed to directly load the Altera EPC16 FlashRam with the designs for the SLAM chip. This provides a mechanism to configure the boards remotely, as will be required in the final system. We developed the software for the full Linker-SLAM integration tests. The SLAM board has Stereo Finder input sent from another SLAM board (preproduction version) and the axial data is driven from a Linker board which received its input from a LinkerTester.

XTC: Check out of XTC production boards was completed in July. Both calibration and colliding beam data from the XTC boards installed on the detector have been read out and analyzed. The timing resolution on the detector is consistent with the 2.4ns resolution we observed in the test stand. We identified one minor source of inefficiency in the algorithm

which has been fixed in the XTC firmware. Installation of the remaining XTC boards is limited by TDC availability.

TDC Transition Module: While the production TDC Transition Modules (TDC TM) are being fabricated, work continues on capturing data via the XTC->TDC TM->Fiber Optic->Finder path. We have additionally captured data using a CDF Pulsar board as the receiver in place of the Finder. The data path is robust and the bit error rate has been measured to be $<10^{-14}$.

Cabling: The first half of the production TDC to Finder fibers was tested in July. A handful of bad terminations were identified and these were returned to the vendor for re-termination. The remainder of production is due for delivery in August.

Stereo Finder: The first five assembled production Finder boards were delivered in late July. After a few days testing of the first board, the FPGA download mechanisms had been tested along with all of the VME registers and memories. No problems with the board were seen. Most of the firmware for the Finder was updated for the new board version prior to the board delivery. It is expected that the testing necessary for release of full production will occur in August.

Requisitions were started for the fabrication and assembly of the RX and RX mezzanine cards. It is expected that production will be released for the RX mezzanine in early August and for the TX mezzanine in late August or early September. The production of the Finder transition boards (a version of the Pulsar Transition board) was started.

Significant progress was made in writing test-stand software for the Stereo Finder to operate in an integrated way with the XTC, SLAM and the existing Axial XFT system.

1.3.4 Event Builder – Bruce Knuteson

Continued test stand debugging and debugging during the end of Tevatron stores has been ongoing. At the end of July, the new Event Builder was installed into the CDF acquisition system. We expect roughly one month of commissioning before moving to the new Event Builder as the default system.

1.3.5 Level 3 computers upgrade – Doug Benjamin

A requisition has been placed for 64 Level 3 farm nodes and 28 Converter nodes and the computer racks required to hold the nodes. The specification document has been finalized and the bid process has begun.

An MIT postdoc is making progress on the port of the Level 3 code infrastructure to Scientific Linux, the intended Level 3 operating system coming out of the Fall shutdown.

1.3.6 SVT (Silicon Vertex Tracker) – Alberto Annovi

Software: SVTVME and SVTSIM have been completed for AMSRW, AM++ and TF++. SVTMON has been extended to include preliminary online board simulations.

AM++ and AMS/RW: 12 AMSRW and 12 AM++ have been installed.

Hit Buffer: Work on interfacing to the pulsar infrastructure continues. Access to the mezzanine memories is completed, as is reading in the SVT input port through the

onboard FIFO. Progress was made in communicating between the control and I/O chips. A feature of the AUX card is discovered - without some hardware modifications, jumper settings allow it to either receive data or generate HOLD signals but not both. Once the hardware modifications are made, HOLD signals are correctly generated and received on the upstream boards. Svtvme functions for memory and SPY buffer access during testing and commissioning are prepared, as well as coldstart routines to be used in real data taking.

Track Fitter: During the month of July we were able to get the TF++ working at 70 MHz while reading the external FIFO at 50 MHz. Millions of vertical slice tests showed exact agreement with simulation. Several tests with readout of the TF++ in the vertical slice wedge (both with 32k and 128k roads) showed periodic mismatches with simulation, but these have been traced to a subtle problem related to the board getting in a funny state when it receives the init signal from the backplane. We are in the process of understanding why this happens, and then should be ready for a few more tests before installation.

VI. FINANCIAL STATUS (as of 31 July 2005)

The baseline cost of the Project is $8,196K, consisting of Run IIb Project costs ($6,855K) plus the closeout costs of the silicon detector upgrade ($1,341K), which will no longer be constructed.

Current Financial Tracking Report - The table below contains current values for selected financial tracking quantities that do not appear in the standard Obligations or Cost Performance Reports. For the Silicon Detector portion of the project, we assume a BAC of $1,341K and obtain the ACWP from the Obligations report. Remaining portions of the project have their costs listed in the Cost Performance Report.

	ACWP		BCWP		BAC		Cont.	EAC	ETC	Complete
	Silicon	Non-Sil	Silicon	Non-Sil	Silicon	Non-Sil				
CY 2004										
October	1342	1957	1342	2125	1673	5254	3448	6759	6908	50%
November	1357	2081	1357	2366	1673	5254	3448	6642	6652	54%
December	1341	2199	1341	2673	1673	5254	3448	6453	6361	58%
CY 2005										
January	1341	2277	1341	2909	1673	5254	3448	6295	6125	61%
February	1341	2396	1341	3095	1341	5531	3503	6173	5939	65%
March	1341	2866	1341	3361	1341	5531	3503	6377	5673	68%
April	1341	3028	1341	3378	1341	5945	3089	6936	5656	65%
May	1341	3274	1341	3850	1341	5945	3089	6710	5184	71%
June	1341	3715	1341	4378	1341	5945	910	6623	2477	78%
July	1341	4143	1341	4677	1341	6075	780	6882	2178	81%

CDF RunIIb Obligations Report - This report provides a Level 2 summary of outstanding Purchase Orders (PO) where money has been committed but for which the Project has not been invoiced. This does not include requisitions in the system where a Fermilab PO number has not yet been assigned. A brief description of the columns included in this report is given below:

- Current Month Total Cost – The cost charged to the project for the reporting month.
- Current Month Obligation – This is the total of the obligations made against the project for the reporting month.
- Year to Date Total Cost – This is the total cost charged to the project in this fiscal year.
- Year to Date Obligations with Indirect – This is the total of the obligations made against the project for this fiscal year.
- Current Purchase Orders Open Commitment – This is the total of the open commitments against the project. It includes open commitments from the current and all prior years.
- Prior Year Total Cost - This is the total cost charged to the project in all prior fiscal years.

The total project cost is simply the sum of the Year-to-Date costs and the Prior Year costs. The total committed and spent is the Total Project Cost plus the Open Commitment value.

CDF Project Obligations Report
Through 31 July 2005

CDF RIIb EQU - July FY05 IN $K							
Task Number	Expenditure Category	Current Month Total Cost	Current Month Obligation	YTD Total Cost	YTD Obligations w/ Indirect	Prior Current PO Open Commitment	Prior Yr Total Cost
Silicon	M&S	0.0	0.0	(0.3)	(103.7)	0.0	539.0
	SWF	0.0	0.0	(1.1)	(1.1)	0.0	571.1
	OH	0.0	0.0	(2.7)	(2.7)	0.0	230.9
	Total 1.1	0.0	0.0	(4.1)	(107.5)	0.0	1,341.0
Calorimeter	M&S	0.0	0.0	63.2	21.2	1.6	211.8
	SWF	0.0	0.0	0.0	0.0	0.0	139.1
	OH	0.0	0.0	1.2	1.2	0.0	51.5
	Total 1.2	0.0	0.0	64.3	22.4	1.6	402.3
Trigger/DAQ	M&S	347.0	5.9	1,483.7	1,570.2	144.1	708.5
	SWF	35.0	35.0	364.1	364.1	0.0	220.7
	OH	30.8	0.0	221.1	221.1	0.0	129.2
	Total 1.3	412.9	40.9	2,068.9	2,155.4	144.1	1,058.3
Administration	M&S	1.5	1.5	7.8	7.8	0.0	29.1
	SWF	10.4	10.4	122.1	122.1	0.0	268.2
	OH	3.3	0.0	38.0	38.0	0.0	84.4
	Total 1.4	15.2	11.9	167.9	167.9	0.0	381.7
Total Project	M&S	348.5	7.4	1,554.4	1,495.5	145.7	1,488.5
	SWF	45.4	45.4	485.1	485.1	0.0	1,199.0
	OH	34.1	0.0	257.6	257.6	0.0	495.9
Grand Total		428.1	52.8	2,297.0	2,238.2	145.7	3,183.4

Total Project Cost (Inception To Date):	5,480.5

CDF Project Cost Performance Report (CPR) – This report is generated from COBRA and provides a summary of the WBS 1.2-1.4 costs of the Project down to Level 3 of the Work Breakdown Structure. Silicon detector subproject closeout costs are not tracked here. Input data originates with the status (% Complete) of the Project schedules as reported by the Level 2 managers and actual costs extracted from the Fermilab accounting system. Where possible, costs are accrued for items that have been delivered, but not yet invoiced. This is only possible for a small fraction of our cost. Financial summaries are shown for this reporting period (columns 2-6) as well as the project to date (columns 7-11). Column 12 contains our baseline BAC, and will only be changed after the formal implementation of the Change Control process. Column 13 is the projected BAC, based on the current month's schedule. A number of specialized financial terms and abbreviations used in the CPR are defined here for convenience:

ACWP – Actual Cost of Work Performed. This is the actual cost of tasks that have been completed.

BAC – Budget at Completion. The BAC is the estimated total cost of the project when completed. It is equivalent to the BCWS at completion. The baseline value of the BCWS is contained in column 12 of the Cost Performance Report.

BCWP – Budgeted Cost of Work Performed. This is the scheduled cost profile of tasks that have been completed.

BCWS – Budgeted Cost of Work Scheduled. This is the sum of the budgets for all planned work to be accomplished within a given time period.

CV – Cost Variance. $CV = BCWP - ACWP$

EAC – Estimate At Completion. This is the ACWP to date, plus the BCWS (current scheduled estimate) of remaining tasks. $EAC = (BAC\ (current) - BCWP) + ACWP$

ETC – Estimate to Completion. $ETC = EAC - ACWP + Contingency$

Percent Complete - $\%Com = \frac{BCWP}{BAC}$

SV – Schedule Variance. $SV = BCWP - BCWS$

CDF Project
Cost Performance Report
as of 31 July 2005

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:				Contract Type/No:			Project Name/No: CDF RIIb Mstr Equ - D		Report Period: 6/30/2005	7/31/2005			
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work	Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling			
1	6,855,000		0	0	0.00	6,855,000	0		0	0			
Funding Type-CA WBS[2] WBS[3]	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance				
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Baseline BAC	Latest Revised BAC	BAC Delta
EQU Equipment													
1.2 Calorimeter Upgrades													
1.2.1 Central Preshower and Crack Detectors	0	0	0	0	0	444,504	444,504	442,924	0	1,581	444,504	444,504	0
1.2.2 Electromagnetic timing	0	0	0	0	0	23,403	23,403	23,403	0	1	23,403	23,403	0
WBS[2]Totals:	0	0	0	0	0	467,908	467,908	466,327	0	1,581	467,908	467,908	0
1.3 Run 2b DAQ and Trigger Project													
1.3.1 Run 2b TDC Project	31,712	2,435	6,962	-29,276	-4,527	624,994	520,077	469,530	-104,918	50,546	655,792	725,375	69,584
1.3.2 Run 2b Level 2 Project	20,398	20,165	7,328	-233	12,837	452,757	452,728	419,910	-29	32,818	473,959	473,959	0
1.3.4 Event-Builder Upgrade	5,753	14,989	3,709	9,236	11,280	435,363	402,776	407,449	-32,587	-4,673	435,363	435,363	0
1.3.5 Computer for Level3 PC Farm / DAQ	262,977	36,534	0	-226,443	36,534	998,903	480,412	337,319	-518,491	143,093	1,185,000	1,185,000	0
1.3.6 SVT upgrade	13,260	17,900	18,399	4,641	-499	335,256	302,739	254,963	-32,517	47,776	362,407	362,407	0
1.3.11 Revised XFTII Project	27,749	190,196	376,461	162,447	-186,264	1,646,614	1,487,019	1,238,154	-159,595	248,865	1,750,000	1,749,142	-858
WBS[2]Totals:	361,848	282,220	412,858	-79,628	-130,639	4,493,888	3,645,750	3,127,325	-848,138	518,425	4,862,520	4,931,245	68,726
1.4 Administration													
1.4.3 Construction Phase	16,106	16,106	15,250	0	857	563,062	563,062	549,644	0	13,419	744,322	744,322	0
WBS[2]Totals:	16,106	16,106	15,250	0	857	563,062	563,062	549,644	0	13,419	744,322	744,322	0
Funding Type-CATotals:	377,954	298,326	428,108	-79,628	-129,782	5,524,858	4,676,720	4,143,295	-848,138	533,425	6,074,749	6,143,475	68,726
Sub Total	377,954	298,326	428,108	-79,628	-129,782	5,524,858	4,676,720	4,143,295	-848,138	533,425	6,074,749	6,143,475	68,726
Management Resrv.											780,251	711,525	-68,726
Total	377,954	298,326	428,108	-79,628	-129,782	5,524,858	4,676,720	4,143,295	-848,138	533,425	6,855,000	6,855,000	0

VII. VARIANCE ANALYSIS – D. Benjamin

Subproject	Schedule Variance	Cost Variance
Run 2b TDC	Limited by operations, and the availability of the detector and the ability to test parts at Michigan. A revised testing plan has been developed and a plan for replacing fewer TDC per access has been implemented.	None
Run 2b Level 2	None	Actual costs have lagged the progress.
Run 2b XFTII	Receipt of production components for the Finder boards occurred very rapidly.	The P.O.'s associated with the work done at the collaborating Universities have been placed and the costs accrued. Receipt of the production components for the Finder boards occurred very rapidly.
Event Builder	Ahead of schedule	Ahead of schedule
Computers for Level 3 and DAQ	The requisition has been placed for 64 nodes the balance will ordered at the end of the fiscal year	Cost will not be incurred until the material arrives. A better model of cost accrual will be implemented.
SVT Upgrade	None	None

VIII. BASELINE CHANGES

A change in the cost of the project was made in with Change Request #23 in early August, 2005. It is mentioned here because the Cost Performance Report given for July reflects this change. The change represented a use of contingency of approximately $45K to cover a change in the parts used for the Stereo Linker Module of the track trigger. Also, $83K was taken from contingency to cover an increase in the cost for data acquisition computers.

IX. FUNDING PROFILES

The funding profile for the RunIIb CDF Detector Project is shown below. This profile has been updated to reflect the new total cost of the project.

	Funding Plan in Current Year $K				
	FY02	FY03	FY04	FY05	Total
DOE MIE	$ 3,460	$ 3,509	$ 1,227	$ -	$ 8,196
DOE R&D	$ 1,670	$ 480	$ -	$ -	$ 2,150
Foreign Contributions	$ 39	$ 518	$ 234	$ 404	$ 1,195
U.S. Universities	$ 24	$ 225	$ 103	$ 26	$ 378
Total	$ 5,193	$ 4,732	$ 1,564	$ 430	$ 11,918